DOCUMENT RESUME

ED 329 793 CE 057 402

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TITLE Indicators of Education and the Economy.
INSTITUTION National Center for Research in Vocational Education, Berkeley, CA.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE Mar 91
CONTRACT V051A80004-88A
NOTE 51p.
AVAILABLE FROM National Center for Research in Vocational Education, Materials Distribution Service, Horrabin Hall 46, Western Illinois University, Macomb, IL 61455 (order no. MDS-014: $2.25).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Academic Achievement; Blacks; College Graduates; *Demography; *Economic Change; *Educational Trends; *Education Work Relationship; *Employment Patterns; Females; Foreign Countries; *Futures (of Society); High School Graduates; Hispanic Americans; Income; Males; Manufacturing; Minority Groups; On the Job Training; Policy Formation; Postsecondary Education; Public Policy; School Business Relationship; Secondary Education; Service Occupations; Whites

ABSTRACT

Eighteen indicators represent important considerations for discussions about education and the economy and strategies for public policy. They describe major aspects of the economy, the demand for labor, and levels for human capital. The indicators are the following: (1) shifts in sectors' relative share of gross national product and the labor force (from manufacturing to service); (2) linkages in the economy--value added; (3) linkages in the economy--output multipliers; (4) U.S. trade deficit in manufactured goods; (5) U.S. competitiveness in high technology products; (6) occupations by industry; (7) job classifications grouped by educational attainment; (8) trends in the unemployment rates of white and black workers; (9) trends in the relative advantage of a college education; (10) employees receiving company training; (11) trends in the composition of the labor force; (12) trends in new entrants in the labor force; (13) comparison of job growth by race, sex, and ethnicity; (14) trends in the percentage of children living in poverty; (15) years of school completed, by race; (16) literacy skills of young adults; (17) international comparisons in mathematics and science achievement; and (18) the geographic literacy of young people. (36 references) (KC)

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Supported by
The Office of Vocational and Adult Education,
U.S. Department of Education

March, 1991

MDS-014

CE057402

FUNDING INFORMATION

Project Title:	National Center for Research in Vocational Education
Grant Number:	V051A80004-88A
Act under which Funds Administered:	Carl D. Perkins Vocational Education Act P.L. 98-524
Source of Grant:	Office of Vocational and Adult Education U.S. Department of Education Washington, DC 20202
Grantee:	The Regents of the University of California National Center for Research in Vocational Education 1995 University Avenue, Suite 375 Berkeley, CA 94704
Director:	Charles S. Benson
Percent of Total Grant Financed by Federal Money:	100%
Dollar Amount of Federal Funds for Grant:	$4,000,000
Disclaimer:	This publication was prepared pursuant to a grant with the Office of Vocational and Adult Education, U.S. Department of Education. Grantees undertaking such projects under government sponsorship are encouraged to express freely their judgement in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
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INTRODUCTION

Many Americans are increasingly worried that the nation is entering the twenty-first century ill prepared to sustain steady growth in the quality of life for ever larger numbers of Americans. Despite the economic recovery of the 1980s, a number of major long-term trends do not bode well for the years ahead. Rapid technological change in combination with fierce international competition are creating economic dislocations that threaten the nation's position in domestic and world markets. Major demographic changes such as the aging of the labor force and the growing number of minorities among new entrants to the workforce, raise troublesome concerns about labor availability, skill levels, and productivity. Additionally, while there is some evidence that the education levels and economic circumstances of minorities have improved during the last three decades, minorities continue to fare much more poorly than the white majority on a number of important measures of well-being. Distressingly, growing numbers of white and non-white children spend large portions of their formative years in poverty and broken families.

As is so often our wont, Americans expect the schools to play a major role in helping us through these economic and social upheavals. The 1980s have spawned an unparalleled spate of reform efforts to bolster public education and restore the confidence of business, labor, and the public at large. Despite these efforts, dissatisfaction remains widespread. Changes in elementary and secondary education have been, at best, slow and modest. If the schools are truly going to help Americans with the social and economic challenges that lie ahead, much more will need to be done.

To help guide this effort, some indicators are needed to better define what needs to be done and to better assess progress along the way. Defining and measuring these indicators is a difficult task. Education is but one of many factors affecting the economy, and the precise influences of education on the economy are not easy to specify or gauge. In this paper, working only with existing data, we have assembled a set of eighteen indicators that represent important considerations for discussions about education and the economy and strategies for public policy. They describe major aspects of the economy, the demand for labor, and levels of human capital.

The Role of Education in the Economy

Conceptually, education's role in the economy can be stated quite simply. Education is one of the primary institutions charged with helping people acquire the knowledge, skills, and abilities to perform productive work efficiently. Additionally, education is a major contributor to advances in technology and general knowledge that also improve productivity. Greater productivity produces a higher standard of living, and, hence, greater investment in education should promote economic development and improvement in general well-being. Preparing people to work productively is not, of course, education's only objective. Nor is education sufficient to ensure that work will be performed efficiently. Many other factors such as the availability of the appropriate capital equipment in the right amounts and good management of people and other resources affect productivity. Nevertheless, other things equal, more highly skilled individuals should generally be more productive.

Economists have tried a variety of approaches to measuring education's contribution to the economy. Work by Edward Denison (1974) throughout the 1960s estimated that education accounted for more than twelve percent of annual economic growth from 1929-1969.[1] Interestingly, Denison predicted that education's contribution to economic growth was likely to decline in the United States because by 1969 elementary and secondary education was almost universally available and gains from additional investment in education were not likely to equal those of the past. The assertion is debatable because it ignores the potential for qualitative improvements in education. Nevertheless, the warning is an important reminder of the law of diminishing returns and a caveat against placing too much stock in the capacity of the education system to solve economic problems.

In addition to estimating the contribution of education to past economic growth, economists have also sought to determine more precisely the appropriate level of future investments in education. Much work has been done on estimating the rates of return to investment in education. Becker (1964) estimated the return on college education to be between ten and thirteen percent for white males in the 1950s. In 1973, Psacharopoulos put the rate of return for all education in the United States at about fourteen percent.

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[1] In addition, Denison estimated that some twenty-seven percent of annual growth was the result of advances in technology and general knowledge, for which education deserves some of the credit. Using different methodology, Schultz (1961) produced estimates similar to Denison's.

As these rates compare favorably to the rates available from other types of investment, it would seem that the nation would benefit from increased investment in education. Thus, Levin (cited in Benson, 1978) estimated in 1972 that an additional investment of $40 billion in the education of male high school dropouts would yield an additional $237 billion in income over their working lives (p. 88).

As useful as these kinds of analyses are, they do not shed much light on what schools need to teach to ensure successful participation in the labor market or advancements in technology and knowledge. While there is ample evidence that higher levels of education are associated with higher earnings, there is remarkably little empirical evidence to assure us these higher earnings are the result of greater productivity. Wage and salary differentials, even in the private sector, often bear no clear connection to differences in the skill levels and productivity of individuals. Moreover, relatively little is known about the types of skills and levels of competency that are required to perform effectively in different industries and occupations.

Thus, while it is possible to describe the general educational attainment of individuals working in particular occupations, as well as their competency on a wide variety of basic and job-specific skills, the precise relationship between education in general and specific skills in particular remains highly elusive. Identifying the relationship is further confounded by the likelihood that the interactions are constantly changing. Consequently, such conceptually simple notions as measuring the demand for labor and assessing the preparedness of supply become wickedly difficult to carry out.

These kinds of difficulties should serve to remind us just how tenuous is our understanding of the interactions between education and the economy. Any attempt to develop indicators, therefore, is likely to be crude and not as well grounded in hard empirical evidence as we might like. The selection of particular indicators is somewhat arbitrary, and debates over the importance of certain indicators are quite appropriate. Indeed, one of our primary objectives here is to stimulate discussion about what indicators are the most useful for monitoring the interactions between education and the economy.

While it is quite proper to ask what empirical evidence supports the inclusion or exclusion of a particular indicator, the absence of clear empirical findings should not be automatic grounds for exclusion. For example, there is very little evidence that higher levels of reading and math skills are associated with higher productivity and higher

earnings. This fact may well be the result of our failure to understand clearly how reading and math skills affect productivity or to conduct studies with sufficient occupational specificity. Certainly, few people would argue that reading and math skills are irrelevant in the workplace. Hence, while we may not yet know precisely how reading and math affect productivity, we may still find it useful to measure the reading and math competencies of prospective workers.

It is within this context of empirical uncertainty that we offer these eighteen indicators for discussion. We believe these indicators of education and the economy tell an interesting story—by no means the only one that could be told, but one that should stimulate some discussion. The economy has indeed been changing over the past forty years. Services as a percentage of employment and as a percentage of gross national product (GNP) play a greater role than ever before. But the dominance of the service sector occurred well before World War II, and while it has continued to grow during the past forty years, that growth has been relatively modest. Manufacturing still accounts for just over twenty-five percent of employment, which is down rather modestly from about thirty-two percent sixty years ago. Moreover, sustaining a healthy service sector may depend critically on a strong manufacturing sector. To the extent that we mindlessly prepare for an increasingly service-based economy and ignore manufacturing, we may hasten economic stagnation and decline, exacerbating trade deficits and further eroding America's lead in high technology.

We emphasize the importance of attending to manufacturing because we believe that Americans typically take this sector for granted. More importantly, American schools, especially elementary and secondary schools, generally do a poor job of teaching students about contemporary manufacturing—the products we produce, the production methods that are employed, and the kinds of occupational opportunities provided. Manufacturing and its related service industries remain largely out of sight for most of America's young people. Schools miss countless opportunities to ground the abstract principles of math and science in concrete modern manufacturing techniques. One consequence of this disregard for manufacturing is that manufacturing fails to capture the imagination of most students and engage their intellectual curiosity.

The schools' attention to the service sector is equally superficial, but students are far more likely to have frequent encounters with service industries than with manufacturing. Although far from fully informed, students (and for that matter, teachers

and parents) know more about the workings of retail stores, restaurants, hospitals, banks, law firms, and other service industries than they do about steel making, machine tooling, electronics, or biological engineering. If we are going to satisfy manufacturing's requirements for well-educated labor, as well as its needs for applied research and development, students need more opportunities to understand applications of the school curriculum in the workplace. Moreover, we will need not only a workforce better able to apply advanced technology, but also more technically literate consumers better able to use and understand the technology around them.

The service sector also is a heavy user of well-educated labor. While many service jobs will remain relatively low-skilled, we should not be lulled into thinking that continued growth in the service sector will not require more and better educated labor. Changes in technology also hold promise for improving productivity in the service sector, bringing with them increased demands for better educated, more technologically sophisticated labor.

It is important to remember that in both service and manufacturing sectors, human capital development can affect the ability of employers to reorganize work in more productive ways. Relationships between labor market requirements and human capital formation are probably more interactive than the conventional wisdom would have us believe.

The growing importance of good education is reflected in increasing economic returns to higher education. Although the economic value of college relative to high school declined during the 1970s, this trend has reversed significantly in the 1980s. In 1985, male full-time workers with college degrees earned about 1.4 times as much as male workers with only a high school diploma, up from a ratio of about 1.2 in 1978.

This growing demand for better educated labor is, of course, part of the reason for heightened concern about schools among business leaders. Schools simply are not meeting demands. Moreover, growing numbers of minority students in elementary and secondary education—populations that historically have not been well served by public schools—suggest that, unless schools can do a better job of educating minorities, shortages of well-educated labor will become more severe.

This prospect of a tightening labor market is, in some respects, good news. Powerful economic incentives will encourage more efforts to improve education, especially

for the growing numbers of minority students. One of the nation's most intractable problems, underemployment and unemployment among minorities, may finally yield to at least a partial remedy.

We must, however, guard against naive optimism. During the 1980s, unemployment rates for black workers increased significantly, both in absolute terms and relative to white workers. Differences in the age distribution between blacks and whites partially account for these disparities, but there is ample evidence that the labor market continues to employ disproportionately large numbers of blacks, as well as Hispanics, in low-paying occupations that are projected to grow more slowly than most of the higher paying occupations now dominated by the white majority.

Furthermore, one should not overestimate the impact of changing demographics on schools or the labor force. The percentages of minority enrollments and minority workers are and will continue to increase, and, in a few states, minorities will even become the majority in public schools and among entry-level workers. Nationally, however, elementary and secondary enrollments will remain overwhelmingly white, as will the majority of new workers entering the labor force.

Consequently, while the economic pressures will increase to improve the education levels of both minority and majority students, employers will have other, albeit potentially more costly, options if schools cannot meet the challenge. These alternatives include sending more work overseas to Asia and South America, retaining older workers past traditional retirement age, luring even more women into the labor force, and increasing automation of routine, low-skilled labor functions in both manufacturing and services. In short, while there will be a favorable economic climate for school reform during the next two decades, business has alternatives. Simply assuming that economics will force the issue would be a serious miscalculation. It is easy to imagine a scenario of continued erosion in America's economic position, a decline that, while noticeable throughout the entire society, would bear most heavily on minorities and the poor.

School improvement, therefore, will require a conscious strategy for change, a strategy that carefully assesses the strengths and weaknesses of American education and that proposes new directions that can be well-monitored and modified as needed. American education is not without some major successes. Levels of educational attainment, the percentages of people completing high school and college, rose steadily and dramatically

over the past forty years. The gains in attainment are as impressive for blacks as they are for whites. Moreover, almost all young adult Americans can read and compute at minimal levels of competency.

Nevertheless, only about a quarter of young American adults possess the more advanced reading and math skills that employers say are increasingly required to perform effectively in the labor market, and only twelve percent of Hispanic young adults and three percent of black young adults possess such skills. Further, American students consistently score lower on tests of math and science knowledge than their peers in other countries. Young Americans' knowledge of important places in the world is shockingly poor and worse today than forty years ago. In short, we could be much better prepared to compete in the world economy and to participate in the "global village."

There are, however, limits on the capacity of education to strengthen the economy, and we must guard against expectations that are unrealistically high and against ill-conceived investments in schooling. Education is but one of many factors influencing the robustness of the American economy. Capital investment, trade policy, international marketing capacities, tax policy, compensation structures, and many other variables figure prominently in the nation's ability to improve productivity and compete in the international economy. The contribution of education will need to be kept in proper perspective.

THE ECONOMY

Economic Activity

Indicator 1: Shifts in Sectors' Relative Share of GNP and the Labor Force

- Nearly three-quarters of the labor force is now employed in the service sector.
- The major shift from manufacturing to services occurred before World War II; since then, the relative growth in the service sector has been modest, whether measured by percentage of total employment or percentage of GNP.

Two prime indicators for the importance of the industries which make up our economy are their relative share of national employment and output. As an indicator of the demand for labor, employment patterns by sector are especially significant. Over the past four decades, the share of employment represented by service-producing industries has risen slowly from roughly three-fifths to three-fourths of all jobs, while the share represented by goods-producing industries has fallen from one-third down to one-quarter of employment.

Not only is employment in goods-producing industries growing more slowly than in services, but goods output is also growing more slowly. As a result, the proportion of the gross national product (GNP) represented by goods has declined both in current-dollar terms and in figures adjusted for inflation. Measured in constant-dollar figures (1982 base), goods output declined from thirty-five percent to thirty percent of GNP between 1947 and 1986, while services output increased from sixty to sixty-seven percent. The current-dollar (unadjusted) figures show an even greater change: goods production declined from thirty-five percent to twenty-six percent, while services rose from fifty-five percent to seventy-one percent.[2]

While service industries clearly dominate the economy, it is important to emphasize that manufacturing still plays a major role. America is not yet a truly post-industrial society. Moreover, as shall be further noted, sustaining a healthy service sector may depend on sustaining a robust manufacturing sector.

Recognizing the continuing importance of manufacturing to the economy has important implications for education. Elementary and secondary schools generally do not communicate well the nature of contemporary manufacturing or the kinds of career opportunities that are available in the manufacturing world. Furthermore, opportunities are missed to ground many of the abstract principles of math and science in concrete manufacturing applications. Consequently, manufacturing fails to capture the imagination of most students and remains outside their experience and understanding.

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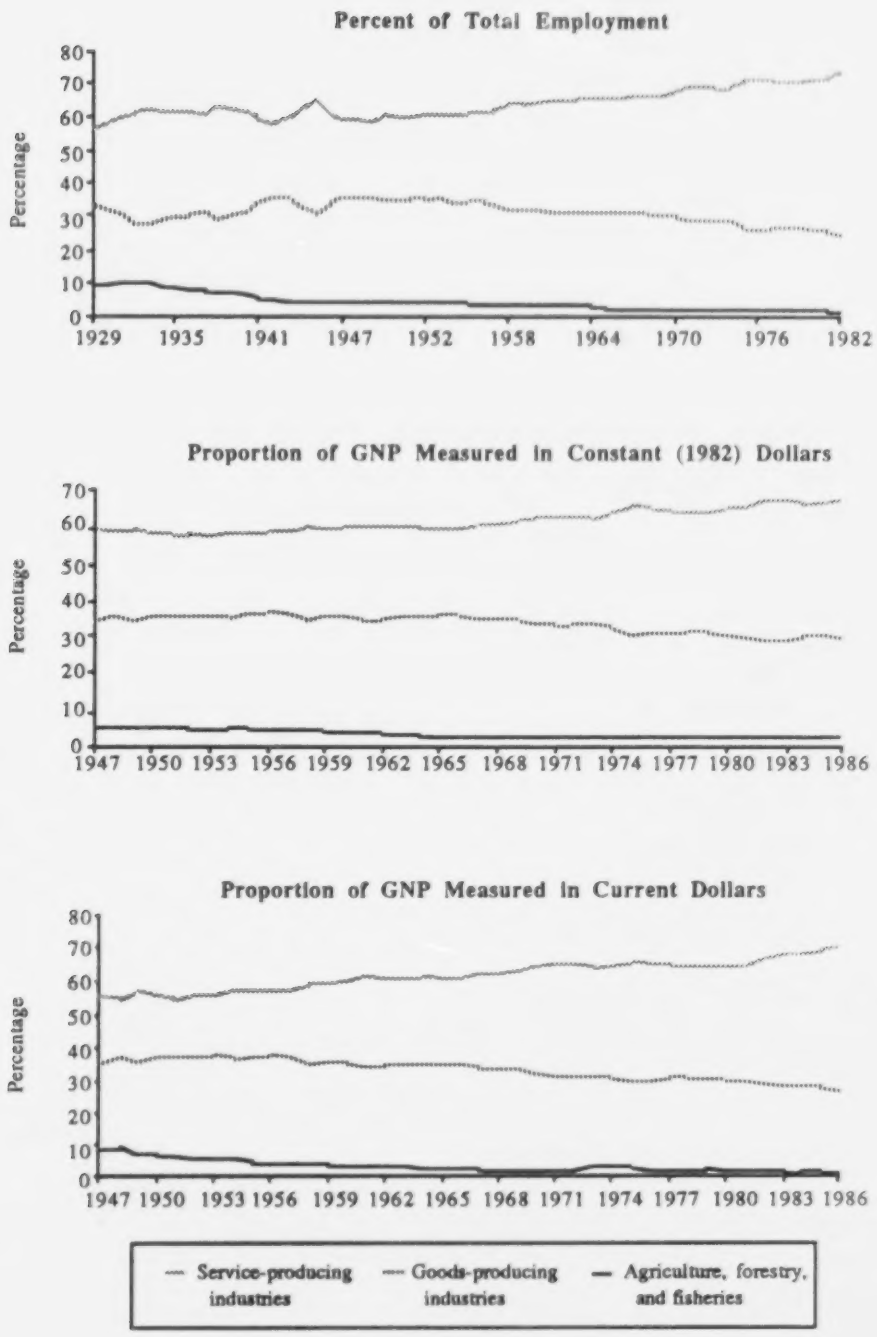
[2]The reason for the difference between these figures is that the adjusted values are calculated using a different price index for each industry in order to factor out price changes. Thus, the adjusted value is a measure of output in units or physical quantity, while the unadjusted figure reflects not only units, but also changes in cost per unit. Goods-production's share of GNP shows a more dramatic decline when measured in current dollars because the cost of goods is rising less rapidly than the cost of services. Factors such as automation have brought about increased efficiency in goods production, so that less capital (including labor) is needed to produce a given quantity of goods.



SOURCE: Office of Technology Assessment (1988).

Indicator 2: Linkages in the Economy—Value Added

- The U.S. economy is becoming more interconnected over time. Most industries today require greater inputs from other sectors in order to deliver their final products.

- Service industries tend to require fewer external inputs than goods-producing industries. Conversely, demand for goods creates greater secondary demands for other goods and services.

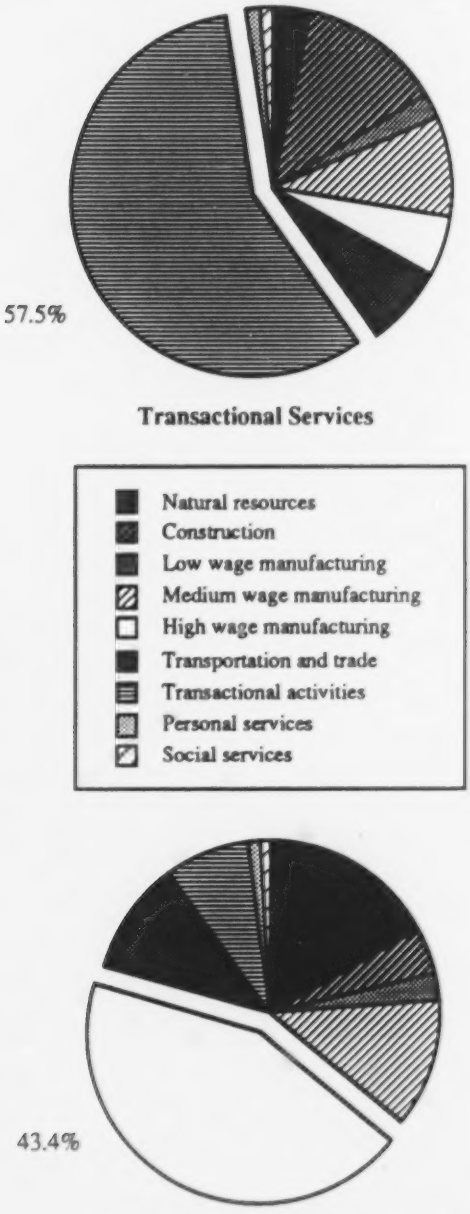
To some extent, the distinction between the manufacturing and service sectors is misleading, as the two are often linked quite closely. The production of goods and services today depends on an increasingly complex set of production networks which provide the ingredients for final products. For example, the construction industry requires inputs of natural resources such as stone and concrete, as well as manufactured goods such as cranes, welding tools, and bulldozers. Shipping and trucking services are needed to transport the construction materials. Financial and information services are needed as well to provide important inputs necessary to manage the operation of construction firms.

Such linkages give us a different measure of the importance of the various sectors of our economy. Instead of just measuring the percent of GNP and employment directly attributable to a given sector, they show the extent to which growth and activity in one sector can fuel economic activity in others. Two ways of evaluating sectorial linkages are presented here. The first is the value added produced throughout the economy as a result of the purchase of products from a given sector. Value added is equal to gross output less the amount paid out for intermediate inputs; the remaining amount, the value added, is realized in wages paid and returns to capital.

As can be seen in the first diagram opposite, out of $100 in services purchased from the transactional (financial and information) services industry, $57.50 is retained within the industry in the form of value added. The rest of the value is created in other sectors which provide the direct and indirect inputs involved in the production of transactional services. By contrast, only about $43.40 would be retained as value added in high wage manufacturing industries such as automobile and steel manufacturing. As a result, growth in high wage manufacturing output is more likely to stimulate growth in other sectors because the production of manufactured goods requires more inputs from other industries.

Education, therefore, must pay close attention to the requirements of manufacturing. Education has an important role to play in ensuring not only that the skill requirements of the manufacturing sector are well met, but also that a sound base of research and development in manufacturing is sustained.

Value Added Derived by Production Sector from the Purchase of $100 of Product (1980 dollars)



SOURCE: Office of Technology Assessment (1988).

Indicator 3: Linkages in the Economy—Output Multipliers

- While goods production accounts for a decreasing share of GNP, goods production still plays a major role in the economy because of its links to the rest of the economy.

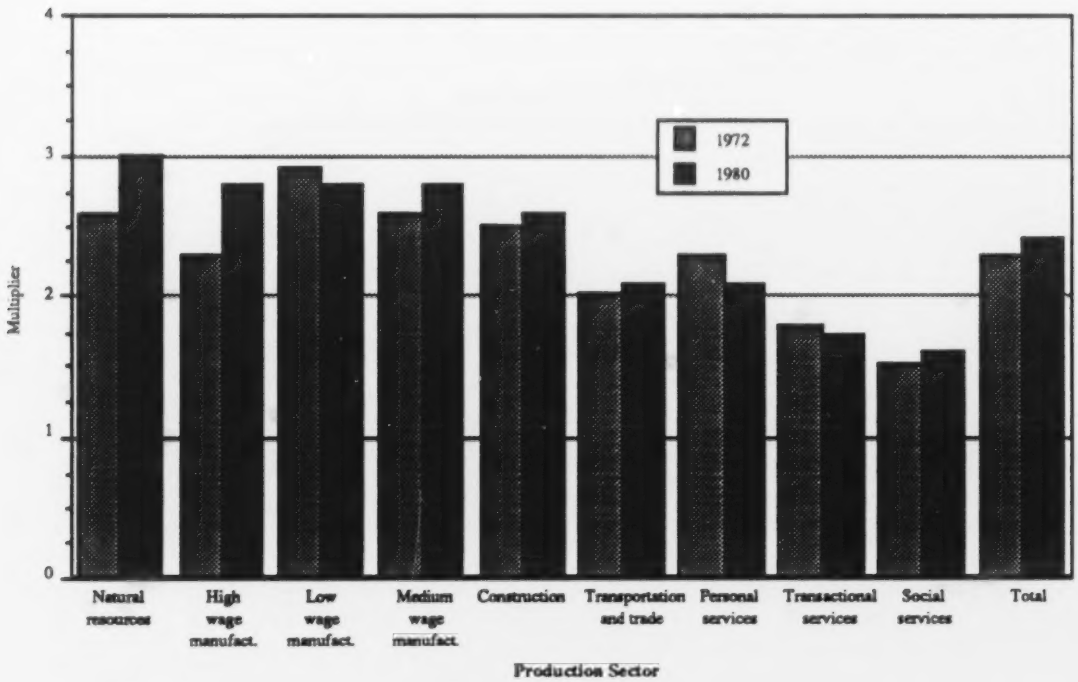
Goods-producing industries generally require more external inputs than do service industries. Another way of looking at the "linkage" of a given sector is its "output multiplier." This is a measure of the total output which results from $1 of demand in a given sector. For example, if $1 of output in construction requires the purchase of sixty cents of products from other industries, then the output multiplier (so far) is equal to $1.60. In fact, it would be higher, since each transaction results not only in secondary transactions, but in tertiary transactions, and so on. A high output multiplier thus indicates that an industry both requires large amounts of external inputs and that the purchase of its products generates a substantial amount of economic activity in a number of intermediate transactions.

The diagram opposite shows the output multipliers calculated for ten production sectors in 1972 and 1980, as well as for the economy overall. As can be seen in the last column, the overall economy became more integrated between 1972 and 1980, as the production of most goods and services increasingly incorporated inputs from other industries. Whereas $1 in demand for goods and services in 1972 created $2.30 in output in 1972, by 1980 the same demand created $2.40 in output. The overall trend also holds for each individual sector, with the exception of low wage manufacturing, transactional services, and personal services. The diagram also shows that demand for goods brings about greater output in the overall economy than demand for services.

Taken together, this data suggests that although goods production accounts for a declining share of the GNP and the labor force over the years, it still plays an important role in the national economy. In fact, it has been argued that a strong manufacturing sector is essential for the continued growth of service industries, especially transactional services. Not only do service industries depend indirectly on the demand for goods to create demand for their products, but some services may depend on the continued presence of strong domestic industries in order to retain expertise in the technological and organizational techniques which they provide as services to those industries (Cohen & Zysman, 1987).

The tight linkages between the service sector and manufacturing imply that a loss of domestic manufacturing will eventually result in the loss of the services jobs tied to manufacturing. Services are complements to manufacturing jobs and not substitutes or successors. Current changes in the U.S. economy from manufacturing to services are qualitatively unlike earlier changes in the economy from agriculture to manufacturing. While agricultural jobs have decreased in this country, domestic agricultural production has increased dramatically. The services tied to agriculture (crop dusters, tractor parts stores) have, therefore, stayed in this country. If manufacturing production moves overseas, the services jobs dependent on manufacturing will soon follow.

Output Multipliers for 1972 and 1980



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *The Input-Output Structure of the U.S. Economy* (1972); *Survey of Current Business* (1979, April); and Input-Output Tables (1980) (cited in Office of Technology Assessment, 1988, p. 158).

International Competitiveness

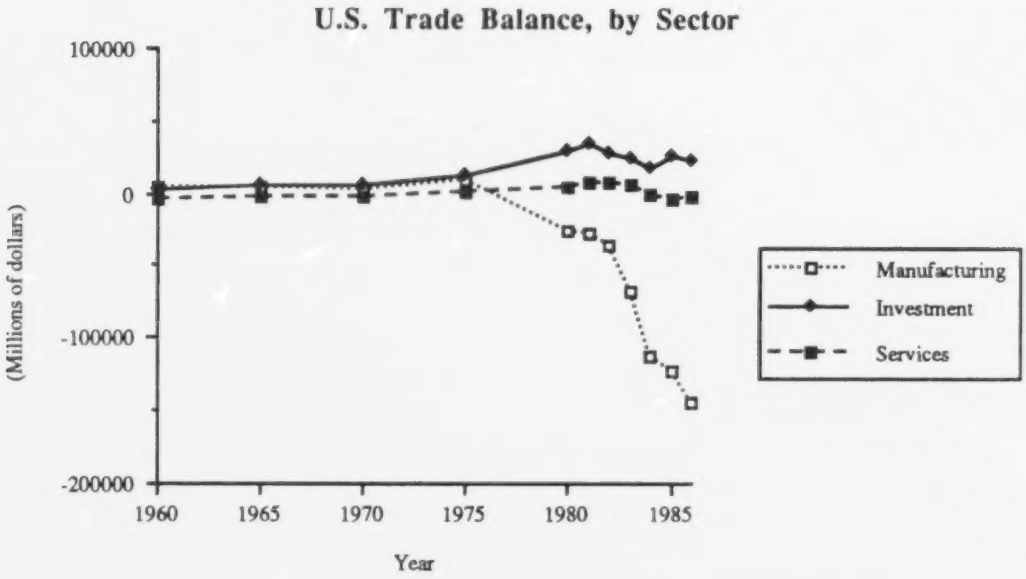
Indicator 4: U.S. Trade Deficit in Manufactured Goods

- Decreases in the goods-producing sector of the economy has contributed to the growing balance of trade deficit.

The American transition from a goods-producing economy to a service economy has not taken place in isolation. It has taken place as part of intense international competition—competition for markets, factories, and skilled workers.

Over the last decade, as manufacturing's share of the overall economy shrank, domestic demand for goods was increasingly satisfied by imported goods. The combination of slower growth in U.S. goods exports and the steady increase in imports resulted in an enormous growth in domestic manufacturing's overall contribution to the nation's trade deficit. The graph on the following page shows that while the U.S. maintained a relative advantage in services internationally, we ran a large and growing deficit in goods trade through the 1980s. Given the linkages between sectors of the economy, such radical shifts in the international competitive position of one sector can reverberate throughout the economy and have a dramatic impact on the kind of jobs available to workers.

While the size of the trade deficit is an imperfect indicator of American competitiveness, for a variety of reasons, other measures also indicate an erosion of the U.S. competitive position with other nations. Measured by declining shares of world markets for exports, lagging rates of productivity increases, eroding profit margins, declining real wages, increasing price elasticities of imports, and by an eroding position in high technology markets—American competitiveness faces severe problems.



SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis (1988), Table 1.

Indicator 5: U.S. Competitiveness in High Technology Products

- The United States' role as the world's high technology leader has also eroded over the last decade.

Within manufacturing, the high technology industries have been termed the "transformative sector" because their products and processes alter or transform the goods and production arrangements throughout the economy. That is, they are inputs to the products and production processes of other sectors, and, consequently, transform those industries through their evolution.

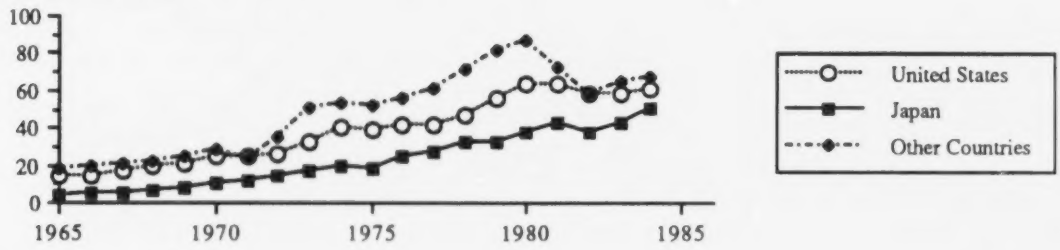
Unfortunately, the status of the United States as the world's high technology leader has eroded over the last decade. Trade in high technology dropped from a surplus of $31 billion in 1981 to $3 billion in 1985, and in 1986 the country incurred a deficit of $2.6 billion (National Science Foundation, 1988b). The graph at the top of the next page shows that in 1984, the latest year for which data is available, the United States was still the world's largest exporter of high technology products. However, recent reports state that in specific industries such as electronics, the U.S. share of the world market has dropped from fifty to forty percent in the last three years while Japan's share rose from twenty-one to twenty-seven percent.

While it is hard to determine whether the U.S. high technology capacity is in actual decline or if the rest of the world is simply catching up to us, it is clear that our position as leader of production of high technology products is quickly eroding. The graph at the bottom of the next page shows that Japan's annual share of U.S. patents has grown from four to nineteen percent since 1970, while the U.S. share of U.S. patents slid from seventy-three percent to fifty-four percent. The share of patents held by the Japanese increased in every technology except genetic engineering, and increase in share was especially large in combustion engines, laser light technology, and computing and accounting machines. The companies with the most U.S. patents in 1987 were Canon, Hitachi, Toshiba, and General Electric.

Education is but one of many factors affecting U.S. competitiveness in high technology products. Nevertheless, this indicator provides an indirect measure of how well American education, particularly in math, science, and engineering, helps sustain the nation's competitiveness in high technology.

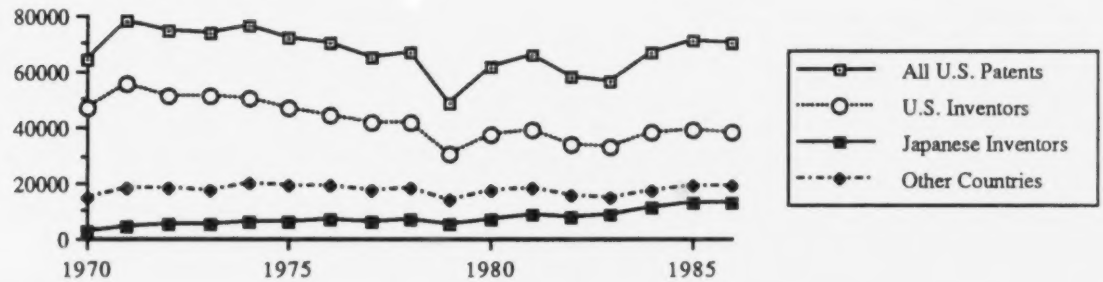
Exports of High Technology Products, by Selected Countries: 1965 to 1984

(Billions of 1982 Dollars)



U.S. Patents Granted, by Nationality of Inventor

(Number of Patents)



SOURCE: National Science Foundation (1988a), Appendix tables 7-10 and 6-8.

THE DEMAND FOR LABOR

Skill Demands

Indicator 6: Occupations by Industry

- Skill requirements in manufacturing are changing rapidly, with some occupations requiring higher levels of skill, others less, and still others about the same.

- Jobs in the expanding service sector represent a broad range of high skill, high wage jobs—especially in finance, marketing, and professional services—as well as low paying, low skill jobs.

Technological advances and other changes are changing the educational requirements of the labor market. As manufacturing changes from mass production to flexible production and as the service sector accounts for an increasing proportion of all jobs in the economy, the mix of skills and competencies required of the workforce will also change.[3]

While many of the jobs in the newly expanding service sector will be low skill, low wage occupations, many will be high skill, high wage jobs in finance, marketing, and other professional fields. An examination of the educational demands of occupations within industries shows that many of the jobs in the expanding service sector include those traditionally filled by workers with the highest educational levels.[4] In the transactional occupations (finance and marketing), thirty-two percent of all jobs consist of jobs held by the highest educated workers, while fifteen percent are held by workers with the lowest educational attainment.

However, the distribution of educational attainment among job incumbents does not always characterize the skill demands of jobs. Much better information is needed on the educational requirements for working effectively in different occupations and industries.

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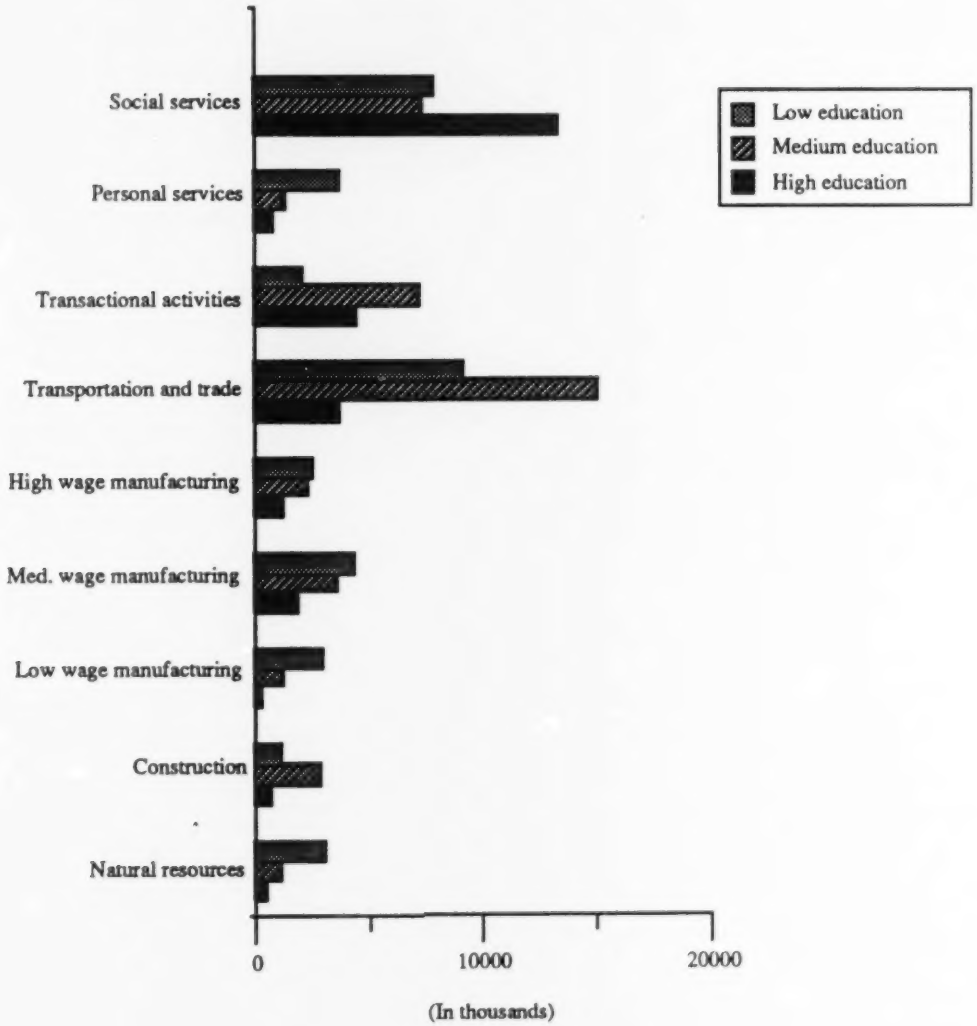
[3]Whether or not there will a general upgrading or downgrading of skill requirements for future jobs is still somewhat controversial. For reviews of the research literature that conclude that there is a general trend toward upgrading, see Adler and Borys (1987) and Baran and Parsons (1986). For arguments for the deskilling hypothesis, see Shaiken (1984) and Levin and Rumberger (1987).

[4]Criteria for assignment to high-, medium-, and lower-education groups for this indicator were as follows: Group I includes the clusters in which at least two-thirds of the workers in 1986 had one or more years of college. Group II includes the clusters in which the median years of school completed was greater than twelve, and the proportion of those workers with less than a high school education was relatively low. Group III includes occupational clusters in which the proportion of workers having less than a high school education was relatively high—more than thirty percent.

Employment, by Occupation and Industry, 1984



SOURCE: Silvestri and Lukasiewicz (1987), pp. 46-63.

Indicator 7: Job Classifications Grouped by Educational Attainment

- Between 1900 and 1980, changes in the occupational structure of the U.S. workforce resulted in dramatic changes in the skill requirements of most jobs.

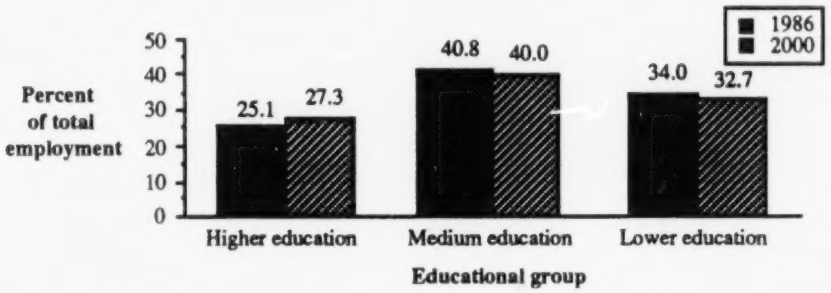
- This general trend is projected to continue into the near future; from 1986 to 2000, the fastest-growing jobs will be those currently filled by the best educated portion of the labor force.

As the economic structure of the United States has changed over time, so has the occupational structure of the U.S. economy. Long-term trends in employment shares by broad occupational groups show a clear pattern of increases in the skill requirements of most jobs. The most dramatic change occurred in the highest and lowest skill jobs. In 1900, about thirty percent of the labor force worked as laborers, either farm or non-farm, and about ten percent worked in either professional, technical, or managerial occupations. By 1980, these percentages had roughly reversed—about six percent were working as laborers and twenty-six percent as professionals, technicians, or managers (Berryman, 1988).

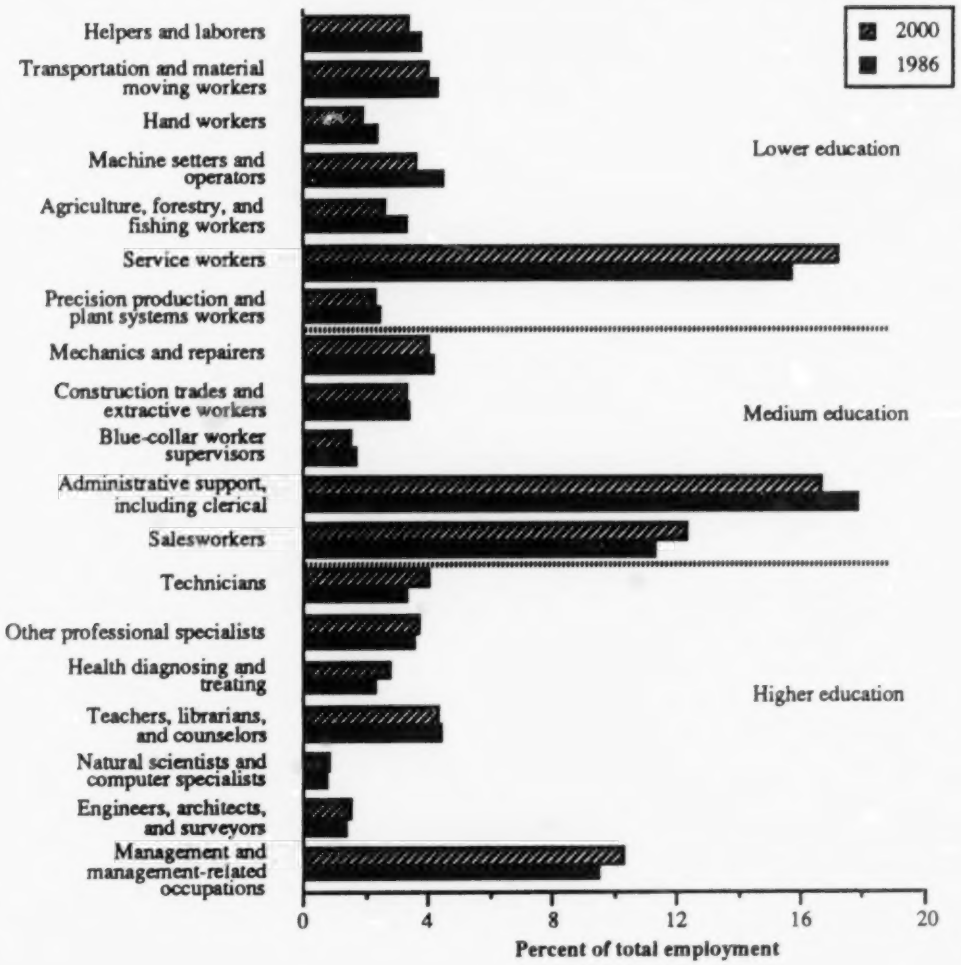
Forecasts of the future job market indicate that those occupations expected to evidence the largest job growth between 1986 and 2000 include those traditionally held by workers with the highest educational levels. Among the occupations currently held by the best educated workers, nearly every category is expected to grow at a rate faster than average. For all of the occupations currently held by the lowest educated workers, only salesworkers and service workers are expected to grow. Nevertheless, for every one hundred jobs in the year 2000, almost thirty percent will be in sales or other service occupations that typically require low levels of education.

However, trends in the number of jobs by occupation category tell us little about the changes in the educational and skill requirements within job categories over time. For example, the name of a job and the educational achievement of workers filling those jobs may have remained constant over time, but the occupational content and the skill requirements of that job may have changed. Case studies of specific industries and occupations, including those using sales and service workers, add context to the data on employment by occupation by describing the content and skill requirements of jobs and how content and skills are changing. For example, research conducted by the Institute on Education and the Economy at Teachers College indicates that in the textile and banking industries, jobs traditionally considered to require minimal skills are becoming increasingly more complex and intellectually demanding (Noyelle, 1989; Bailey, 1988). These studies suggest that the key change in the economy for both manufacturing and service sectors is a shift from mass production to flexible production. Flexible production in manufacturing and service requires workers with a much wider range of skills and capabilities than before.

Employment, by Level of Educational Attainment, 1986 and Projected 2000



Employment in Broad Occupational Clusters, by Level of Educational Attainment, 1986 and Projected 2000



SOURCE: Silvestri and Lukasiewicz (1987), pp. 46-63.

Unemployment Rates

Indicator 8: Trends in the Unemployment Rates of White and Black Workers

- The unemployment rate of black workers has increased over the last decade, both in absolute terms and relative to the white unemployment rate.

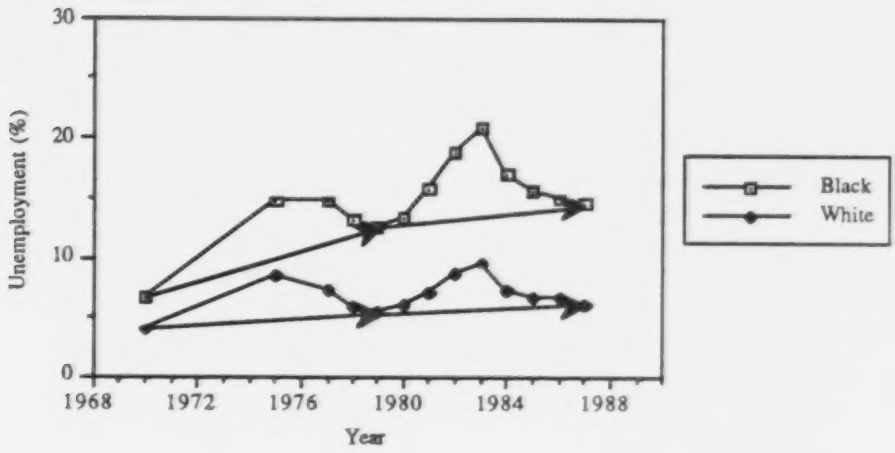
- This increase is due in part to the changing demographics of the black worker pool, with a larger share of the black applicant pool made up of young workers with high unemployment rates.

In addition to looking at the overall demand for labor, it is important to look at the demand for the labor of various subpopulations. Insofar as education affects employability, it is clear that American schools have done a poorer job of preparing some students than others: The first graph to the right shows that while in 1970 black workers had 1.7 times the unemployment rate as whites, by 1987 the black unemployment rate was 2.4 times the white rate. The figure demonstrates that the economic dislocations of the mid-1970s and early 1980s had a more severe impact on black workers than they did on white workers. Furthermore, black workers appear to have never fully recovered from the higher unemployment levels, as did white workers when relative prosperity returned.

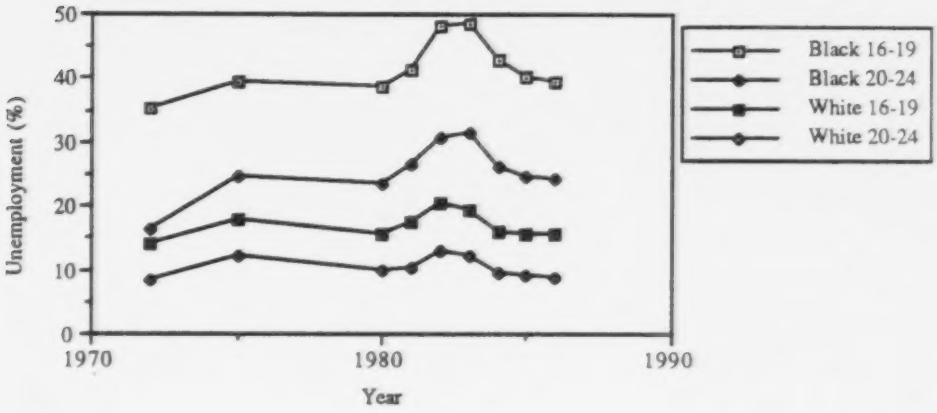
This graph is somewhat misleading, however. Overall increases in the black unemployment rate reflect the changing demographics of the black population as much as changes in the employment status of individual black workers. The bottom graph shows that within specific age groups of the black population, unemployment has been more stable, albeit extremely high for some groups. Changes in the overall unemployment rate for blacks reflect the fact that a larger proportion of the black population consists of younger persons—all of whom have extremely high levels of unemployment.

Nevertheless, these differences provide evidence that there are two labor markets—one for low skill, low wage workers who are disproportionately minority, and one for high skill, high wage workers who are disproportionately white.

Unemployment, by Race: 1970 to 1987



Unemployment, by Race and Age: 1972 to 1987



SOURCE: U.S. Department of Commerce, Bureau of the Census (1987), Table 607.

Economic Returns

Indicator 9: Trends in the Relative Advantage of a College Education

- The economic advantages associated with greater schooling are larger now than in the recent past.
- As of 1984, workers with doctoral and advanced professional college degrees earned seventy-seven percent more than persons with only bachelor's degrees.

As the skill and educational demands of many occupations are becoming more complex and diverse, workers with higher levels of education are being better rewarded in the labor market. Over the last few years, the relative advantage of college graduates over high school graduates in the labor market has grown, widening the gap between the earnings of college graduates and workers with only a high school diploma.

While during the 1970s the economic value of college relative to a high school diploma was declining, since 1980 the income of persons who have attended college has increased relative to the income of high school graduates. In 1985, male full-time workers with five or more years of college earned one and a half times as much as male workers with only a high school diploma. Even workers with just one to three years of college earned substantially more than workers with just a high school diploma, earning on average about thirteen percent more.[5]

Furthermore, a recent study indicates that the relative advantage of college graduates over high school graduates increases with years of experience. In 1985, among workers with one to five years of job experience, those with a college education earned fifty percent more per week than did workers with only a high school education. Among workers with thirty-six to forty years of job experience, college graduates earned almost seventy-two percent more. These advantages have also increased dramatically over the last few years. In 1980, college graduates enjoyed only a twenty-seven percent advantage with one to five years of experience, and only a fifty-five percent advantage with thirty-six to forty years of experience (Murphy & Welch, 1988).

A study by the U.S. Department of Commerce's Bureau of the Census (1987) confirms that just a few extra years of schooling is associated with higher earnings. The study showed that workers with high school diplomas earned over fifty percent more than workers without a high school education. Workers with just a few years of college earned almost twelve percent more than persons with only a high school diploma. The comparative advantage of persons with postgraduate college degrees was particularly marked—workers with doctorate or professional degrees earned forty-three percent more than workers with only master's degrees and seventy-seven percent more on average than did persons with only bachelor's degrees.

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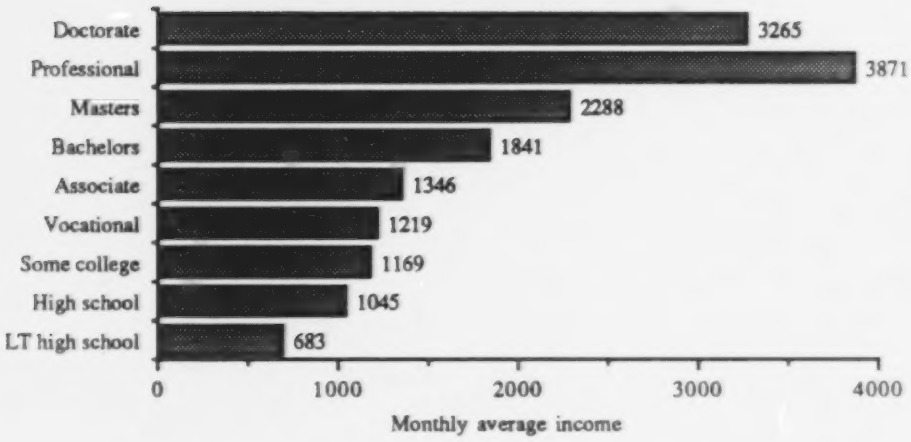
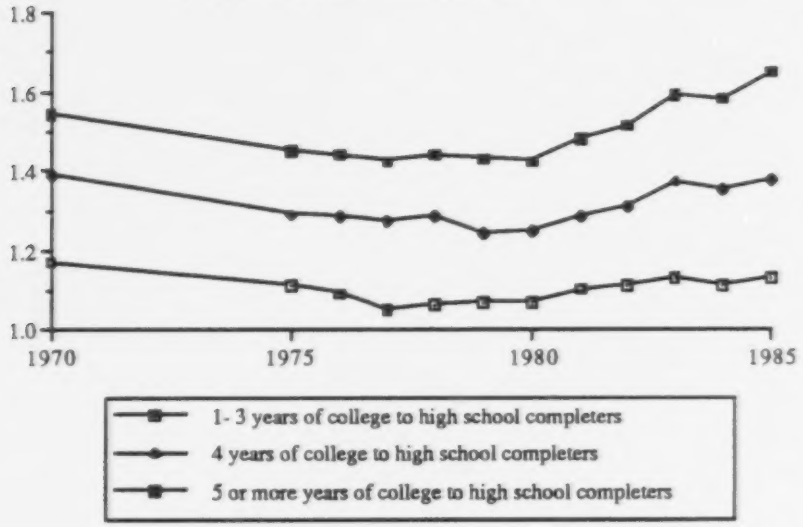
[5]However, the cause and effect relationship between educational levels and earnings is not clear-cut. Education is correlated with many other factors that lead to higher income including ability and family background. Perhaps more importantly, level of education and "employability skills" (punctuality, attentiveness, and motivation) are also highly related.

Four Month Average Income, by Educational Attainment, 1984



Ratio of Income of Male Full-Time Workers, by Educational Attainment



SOURCE: U.S. Department of Commerce, Bureau of the Census (1987, various years).

Indicator 10: Employees Receiving Company Training

Not only are better educated workers rewarded with higher salaries than lower educated workers, but workers with more education also are more likely to receive employer-sponsored training. That is, employers tend to train their best educated employees. Only forty-five percent of those who failed to complete high school, but seventy-one percent of high school completers, received any training by their employers. Moreover, employers continue to train their better educated workers—over thirty-nine percent of college graduates, but only eleven percent of high school dropouts, received more than three or more programs of training.[6] The differences are even more striking for professional and technical training. Only seven percent of employees who did not graduate from high school received this type of training, compared with twenty-seven percent of high school graduates, forty-four percent of those with some college, and fifty-six percent of employees who were college graduates.

Furthermore, employers provide a great deal of training—in 1983, forty-two percent of the men and thirty-four percent of women in the labor force both needed training to get their current job and got some or all of it in formal company programs or informally on the job.[7] Training and education increase employee's earnings, make it easier for them to find and keep work, and raise their productivity. Employer training, therefore, accentuates differences in educational attainment and achievement among employees—differences that have been shown to account for some of the differences in income among workers. Moreover, the relationship between employer-sponsored training and employees' educational level may be a two-edged sword—employees with little education receive little employer-sponsored training; alternatively, employers without a well-educated workforce will not be able to successfully utilize employer-sponsored training.

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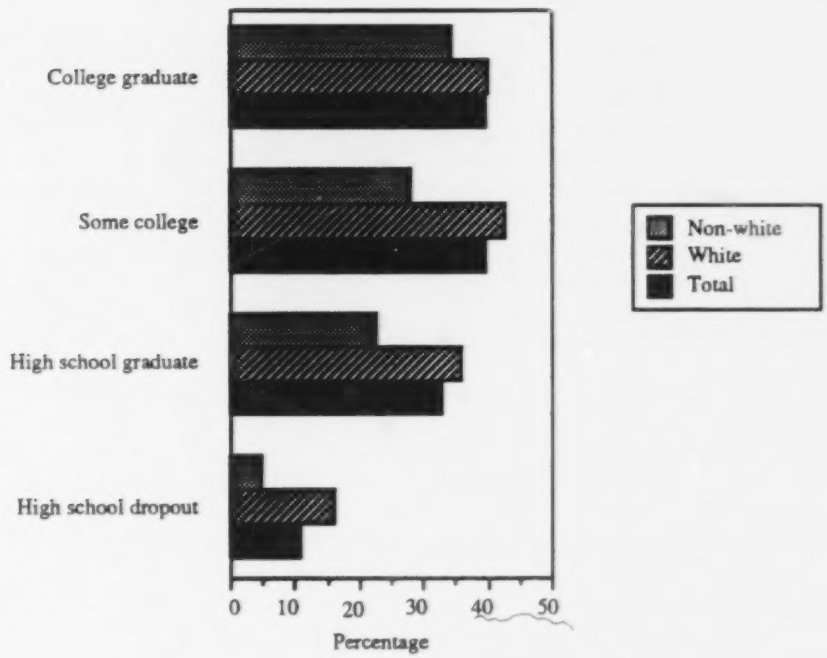
[6]This assumes that receiving three or more training programs is "better" than receiving only one program. This may be true, but more training programs need not imply more training, or better training.

[7]The basis for this indicator is the work presented by Vaughan (1989). The data presented in this indicator is based on Tan (1988).

Percentage of Employees Receiving More than Three Employer-Sponsored Training Programs, 1967-1980



SOURCE: Tan (1988).

HUMAN CAPITAL LEVELS

Demographic Trends

Indicator 11: Trends in the Composition of the Labor Force

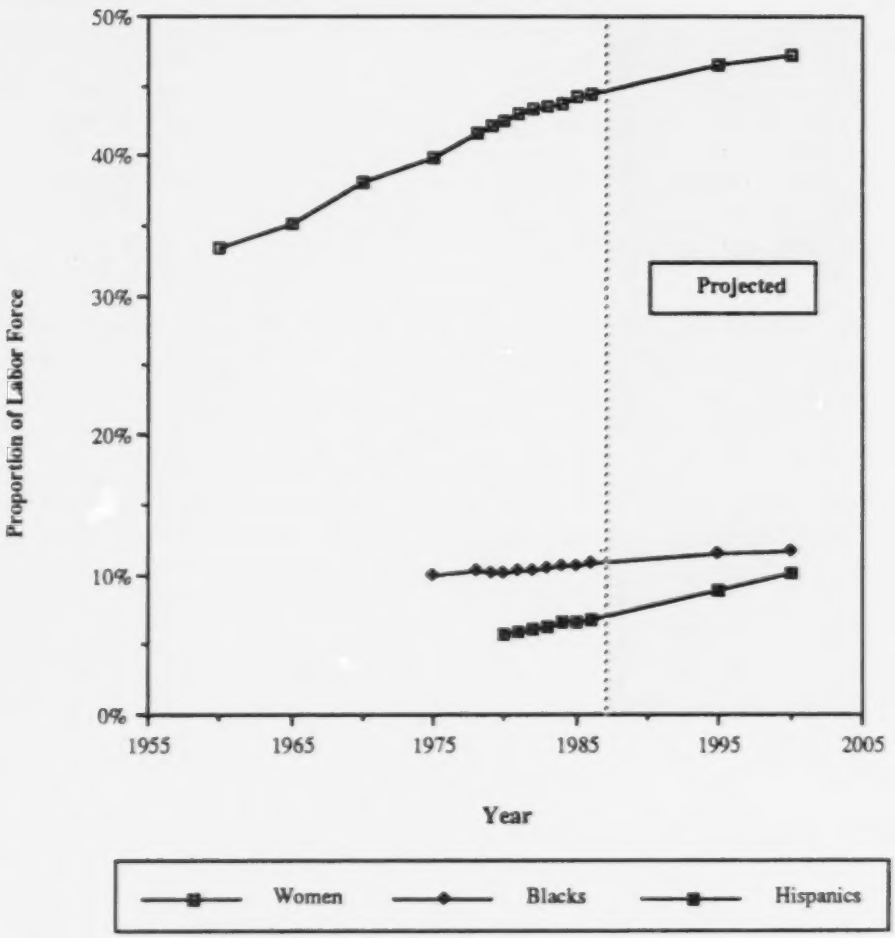
- Continuing the trends of recent years, minorities will make up a growing share of the labor force over the next decade.

- Women will also increase their share of the labor force, though not at the pace of the last two decades. Nevertheless, women will approach one-half of the labor force by the year 2000.

The inability of American schools to better prepare many minority students for successful participation in the labor market is especially problematic because racial and ethnic minorities are expected to account for a growing share of the labor force in coming years. By 2000, the non-white share of the labor force will have grown from around twelve percent in 1975 to nearly sixteen percent. Hispanics, who represented six percent of the labor force in 1980, will account for over ten percent of the labor force in 2000.

Because these racial and ethnic minorities currently suffer from high unemployment rates relative to the general population, the increased number of entrants into the labor force from these groups presents a unique challenge, as well as an opportunity for the 1990s. It is well known that the population of eighteen- to thirty-four-year-olds will be declining during the next ten years; because minorities comprise a greater share of this smaller cohort, industry will be forced to hire a greater percentage of poor and minority entrants into the labor force. To ensure an adequately skilled workforce, industry will have to address the problems of low educational attainment of minority children and a natural increase in minority achievement will ensue. However, there are several alternatives available to employers faced with the prospect of hiring less-advantaged and lower skilled workers. Capital can be invested in automation and other technologies in order to eliminate low skilled jobs. Jobs can be shifted to faster growing parts of the country (many of which have lower minority populations), or they can even be shipped overseas. Employers could also engage in increased competition for better educated (generally white) workers, thus raising wages and possibly luring greater numbers of women into the workforce. Immigration of skilled workers could be encouraged, or older workers could be encouraged to delay retirement.

Trends and Projections in the Composition of the Labor Force



SOURCE: U.S. Department of Commerce, Bureau of the Census (1987), Table 608.

Indicator 12: Trends in New Entrants to the Labor Force

- It is evident from current school enrollment patterns that a growing proportion of new labor market entrants will be from minority groups.

- However, an overwhelming majority of new workers will be white.

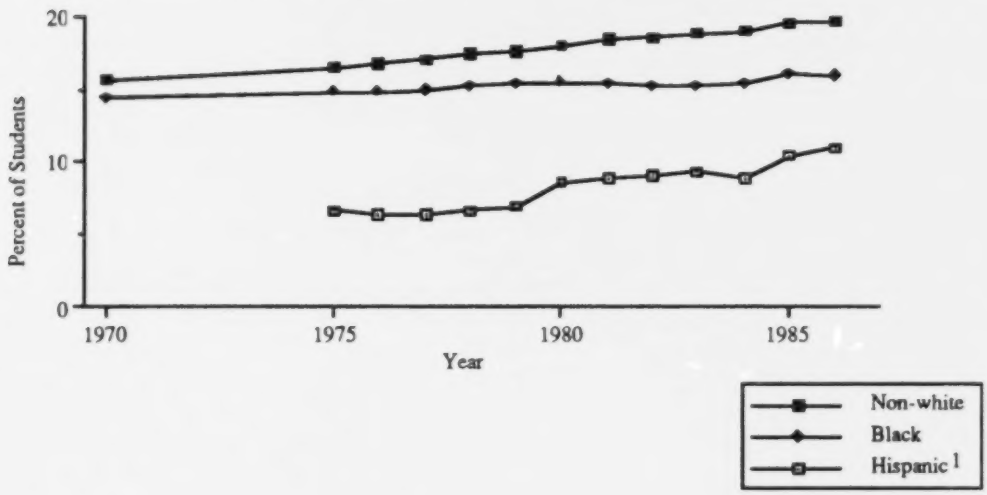
All of the persons who will be applying for work in the year 2000 are alive today. Any new entrants to the applicant pool are now in our schools and colleges. The demographics of the labor pool of the year 2000 are, therefore, fairly clear; to see the future, all we have to do is look at the present.

It is evident from the changing composition of the nation's school population that a growing proportion of the new labor entrants will be minorities. The two graphs to the right show a steady growth of non-white and minority students in our elementary and secondary schools nationwide over the last twenty years. The famous baby-bust of the 1970s and early 1980s was primarily a phenomenon among white non-Hispanic families. While overall elementary and secondary enrollment fell by almost eleven percent between 1975 and 1986, the number of blacks enrolled in elementary and secondary school remained steady through the period and Hispanic elementary and secondary enrollment increased by over forty percent.

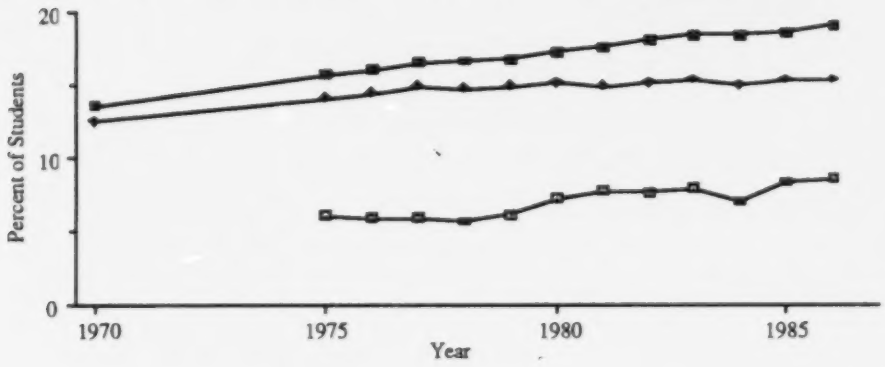
These graphs portray an overall growth in minority school enrollment that, while significant, is hardly startling. As of 1986, an overwhelming majority of school-age children are still from white majority homes. However, in some sections of the country, growth in the minority school-age population has been much more dramatic than this overall picture suggests. For example, in many Western and Southwestern states (such as California), minority students are the majority of students enrolled in elementary and secondary schools. Minority enrollment in the Los Angeles City School District approaches ninety percent. Thus, the Sunbelt, which can be characterized by new high technological jobs, corporate headquarters, and new-found political clout, is also characterized by an emerging workforce pool made up primarily of minority workers.

It is not clear, however, that given these developing changes in the applicant pool of workers, employers will indeed be forced to hire more minority workers. Lack of employment skills among these workers, coupled with the immense cost of training them in the basic computational and reading skills needed in today's workplace, may force employers to try other less costly approaches to keeping their shops and factories running. Among these may be (1) sending more work overseas to Asian, European, or South American facilities, (2) retaining older workers past traditional retirement age, and (3) increasing automation of basic factory functions. While increases in the proportion of minorities in the labor pool provides an opportunity to increase the participation of these groups in the mainstream of American working life, without basic skills, this opportunity may be lost.

Elementary Enrollment, by Race/Ethnicity: 1970 to 1986



High School Enrollment, by Race/Ethnicity: 1970 to 1986



[1] Hispanics may be of any race.

SOURCE: U.S. Department of Commerce, Bureau of the Census (1987).

Indicator 13: Comparison of Job Growth by Race, Sex, and Ethnicity

- Jobs which currently employ large numbers of blacks and Hispanics are expected to grow relatively slowly compared to other occupations.

- As a result, minorities may have even more difficulty finding employment than they do at present.

Although the economy is expected to add about twenty million new jobs between 1986 and 2000, many of these jobs are in fields in which blacks and Hispanics are currently under-represented. Out of seventeen broad occupational categories defined by the Bureau of Labor Statistics, only one that employs a high percentage of blacks is expected to grow at a rate equal to or greater than average. Currently, blacks represent seventeen percent of service workers, and this category is expected to grow at a rate of thirty-one percent between 1986 and 2000. By contrast, blacks represent ten percent or more of those employed in five out of the seven occupational categories which will show the least growth, or which will even decline in number of jobs. In all, nearly fifty-five percent of all black workers are employed in slow- or negative-growth job categories.

Hispanics have a similar employment pattern, but employment among Hispanics is even more heavily weighted toward slow-growth jobs. Once again, the only high-growth group of occupations which employs a greater-than-average percentage of Hispanics is the service workers category, out of which about nine percent of those employed are of Hispanic origin. Every other job category employing a relatively high percentage of Hispanics is expected to grow at a rate below average. This mirrors the low representation of Hispanics among high-growth jobs other than service occupations.

Based on current employment patterns among minorities and women, and projections of job growth for the next decade, we can project the number of new jobs which would be created for blacks, Hispanics, and women if current employment patterns were to remain constant. The results of such a calculation are illustrated in the graph opposite, which also shows the current share of jobs and the share of labor force growth expected for each group.[8] Unless blacks and Hispanics increase their representation in high-growth jobs, black and Hispanic new entrants to the labor force will find themselves competing in an ever-tighter job market.

Of course, we can expect employment patterns among minorities to change somewhat over the course of the next decade, especially since the most advantaged portion of the population, white males, is expected to decline as a share of the labor force. However, this data makes clear the urgent need to provide the skills and education necessary to prepare minority individuals for roles in the future workforce.

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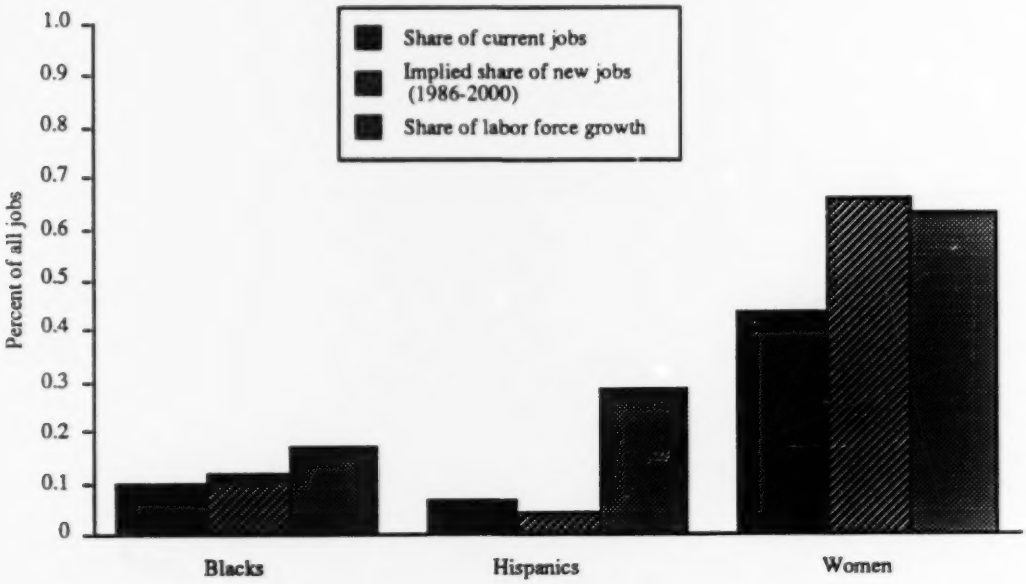
[8]Share of labor market growth indicates what proportion of future growth in the labor market will be due to increases in the number of certain subgroups. For example, of all the growth in the labor market between 1986 and 2000, about thirty percent will be due to increases in the number of Hispanics in the labor force.

Projected Share of New Jobs and Share of Labor Force Growth



SOURCE: Kutscher (1987).

Indicator 14: Trends in the Percent of Children Living in Poverty

- Large numbers of new entrants to the workforce in the year 2000 will have grown up in poor families with single parents.

Many persons entering the workforce in the year 2000 will have grown up in circumstances that have traditionally put young people at risk for failure in school and the workplace. For example, of every one hundred children now entering kindergarten, fifty-nine will live with only one parent before the age of eighteen (Hodgkinson, 1986).[9] Most of these single parent families will be under the sole guidance of a female. With average earnings of full-time female workers under $20,000, many of these families will not earn enough to keep themselves and their children above the poverty level. The "feminization of poverty" has resulted in women *and children* now accounting for over seventy percent of all persons in poverty. Children in these families are more apt to be born with low birth weights, born to teenage mothers, and born to parents with low educational attainment.[10] Many youth are thus starting life already handicapped by physical, cognitive, and emotional disadvantages.

Unfortunately, the number of children growing up in poverty has grown larger during the 1980s. The poverty rate for children under eighteen in 1969 was about half what it had been a decade earlier. In 1959, about one in four children lived in low income families; by 1969, the rate had dropped to one in eight. However, the 1970s saw an increase in the proportion of children living in poverty, and the early 1980s witnessed a virtual explosion in the percent of children living in families whose income fell below the poverty line. By 1983, the rate had climbed again, and almost one in four children were living in poverty. While the proportion of children from low income families fell during the economic recovery of the mid-1980s, one in five in 1987 still lived below the poverty line. This represented approximately thirteen million children, most of whom will be in the labor market in the year 2000. These future workers will have come from homes with few of the material or leisure time advantages of middle or upper class homes and will have grown up in environments that in many cases will leave them ill prepared for the world of work.

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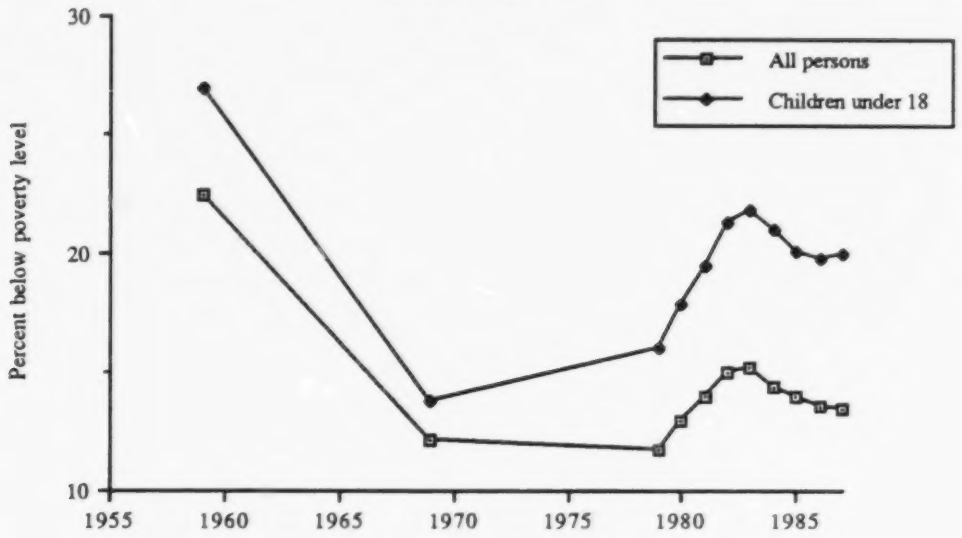
[9] This condition may be transient, however, and not a permanent condition. It is the persistent, long-term exposure to disadvantaged environments that are thought to be most destructive to the academic and social development of children.

[10] Many of these children also will be born with serious physical and mental impairments due to the drug use of their mothers during pregnancy. A recently released national survey of thirty-six hospitals indicated that on average eleven percent of new mothers had used some illegal drug during their pregnancy. Cocaine was the most common drug used ("Cocaine," 1988).

Proportion of Persons and Children Living below the Poverty Line: 1959-1987



SOURCE: U.S. Department of Commerce, Bureau of the Census (1986), and unpublished tabulations.

Educational Attainment in the Workforce

Indicator 15: Years of School Completed, by Race

- Considerable progress has been made over the last forty years in the number of years of schooling that the average U.S. worker receives.
- Black educational attainment has been particularly remarkable since 1940.

Over the last several decades, there has been a remarkable increase in the amount of schooling that the average U.S. worker has completed. Measured in the number of years spent in school, the U.S. workforce is better educated than ever before. The proportion of new workers (ages twenty-five to twenty-nine) who have completed four years of high school has grown from 38.1% in 1940 to 86% in 1987. The proportion of new workers who have completed four years of college has also grown, from only 5.9% in 1940 to 22% in 1987.[11]

Extraordinary progress has been made in the educational attainment of blacks completing four years of high school over the last half century, from about 12% in 1940 to over 83.3% in 1987. Progress has also been made in the proportion of blacks completing four years of college, from only 1.6% in 1940 to 11.4% in 1987. However, despite remarkable progress, black educational attainment continues to lag behind white educational attainment, especially in terms of college attendance.[12] The percentage of whites twenty-five to twenty-nine years of age completing four or more years of college has remained about twice as large as the black rate since the early 1960s.

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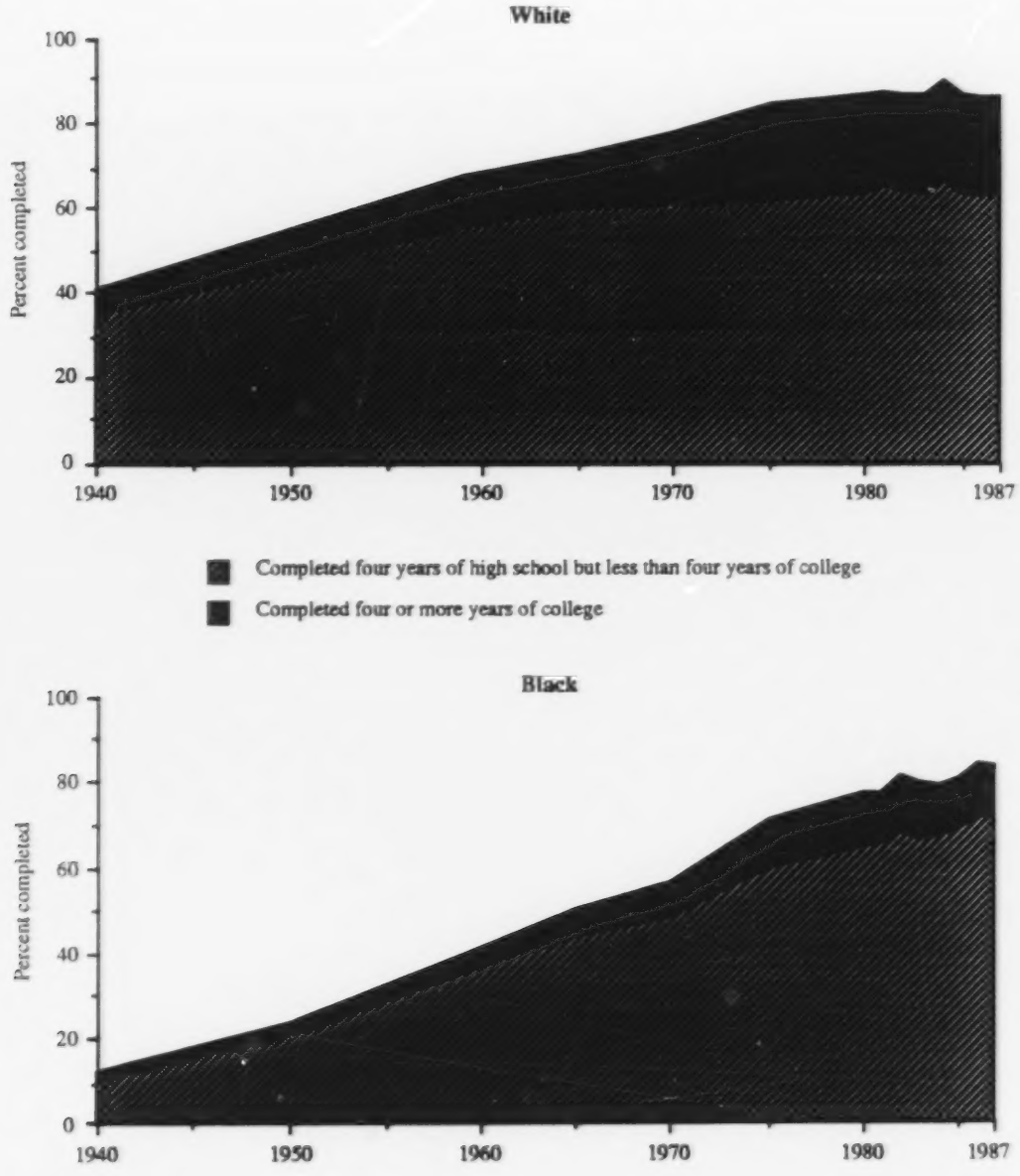
[11] These figures are derived from the Bureau of the Census' Current Population Survey. Respondents are asked what was the highest level of school they have attended and completed. Obviously, merely completing four years of high school or college does not necessarily mean one has either graduated from high school or received any college degree.

[12] It is much easier for blacks to catch up to whites in high school completion since most states provide free public education through grade twelve and have laws mandating compulsory attendance to around sixteen- to eighteen-years old. College attendance is voluntary, on the other hand, and usually entails greater costs in terms of both direct payments and foregone wages.

Percent of 25- to 29-Year-Olds Who Have Completed High School or College, by Race: 1940 to 1985



SOURCE: U.S. Department of Commerce, Bureau of the Census (1987).

Performance

Indicator 16: Literacy Skills of Young Adults

- Practically all young adults are able to read at minimal levels and use basic arithmetic skills.

- Relatively small proportions are proficient at levels characterized by more moderate or relatively complex tasks.

While there has been much improvement in the amount of education attained by U.S. workers, simply counting the years of school completed indicates little about the educational quality of the U.S. workforce. Although more students are now finishing high school than in past decades,[13] many educators and labor specialists agree that educational achievement levels are still inadequate to meet the challenges of the workplace of the future.

The National Assessment of Educational Progress (NAEP) recently assessed the literacy and quantitative skills of young adults who are twenty-one- to twenty-five-years old—those persons just entering the job market. The results show that U.S. schools have succeeded in teaching the majority of their students basic literacy and mathematic skills—most students can add and subtract and read simple texts. However, while almost all students have these primary skills, many are not learning higher reading and thinking skills such as the ability to infer knowledge that is not explicitly stated or the ability to use fractions and percentages.

What also troubles many experts and officials is the particularly low skill levels of black and Hispanic youth. While over sixty percent of white young people could perform "medium level" reading and mathematics tasks such as locating basic facts in a newspaper article or balancing a checkbook, about forty percent of Hispanic youth and less than twenty-five percent of black youth could do so. Only about eleven percent of Hispanic youth and less than five percent of black youth could perform at an "advanced level," for example, accurately calculating the amount to leave as a ten percent tip in a restaurant or synthesizing the main argument of a newspaper article.[14]

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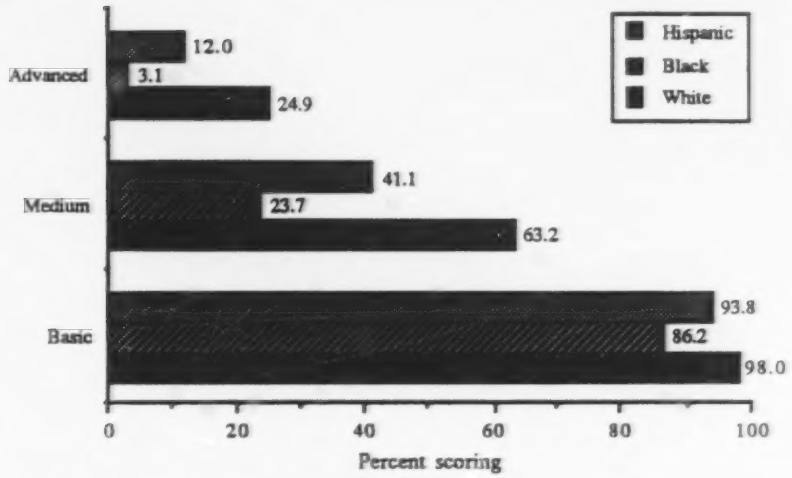
[13] Many students now finishing high school are receiving alternate credentials such as a GED and not regular diplomas. There is some indication that holders of these alternative credentials may not perform as well in later life as regular day school graduates. Therefore, the high completion rates may be masking a more serious educational achievement problem. See Passmore (1987); Tugend (1986), pp. 1-10.

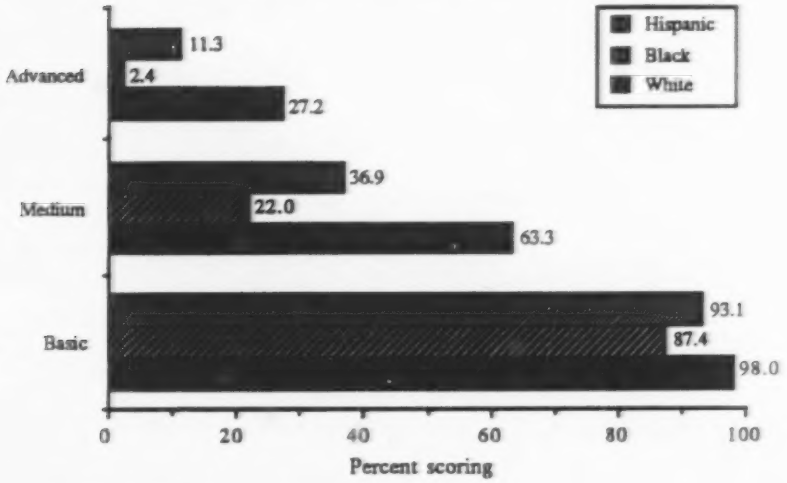
[14] Many would argue that skills such as calculating percentages correctly are in reality basic numeracy skills and not the "higher order skills" as defined by NAEP.

Prose Comprehension of Young Adults



Basic item—write a description of the type of job you would like
Medium item—write a letter to explain an error made in a billing charge
Advanced item—synthesize the main argument from a lengthy newspaper column

Quantitative Literacy of Young Adults



Basic item—add two numbers on a bank deposit slip
Medium item—calculate the price of a meal using a menu and determine the amount of change received
Advanced item—determine a ten percent tip for the meal

SOURCE: Kirsch and Jungeblut (1986).

Indicator 17: International Comparisons in Math and Science Achievement

- On tests of math and science knowledge, U.S. eighth graders consistently score lower than their peers in other countries.

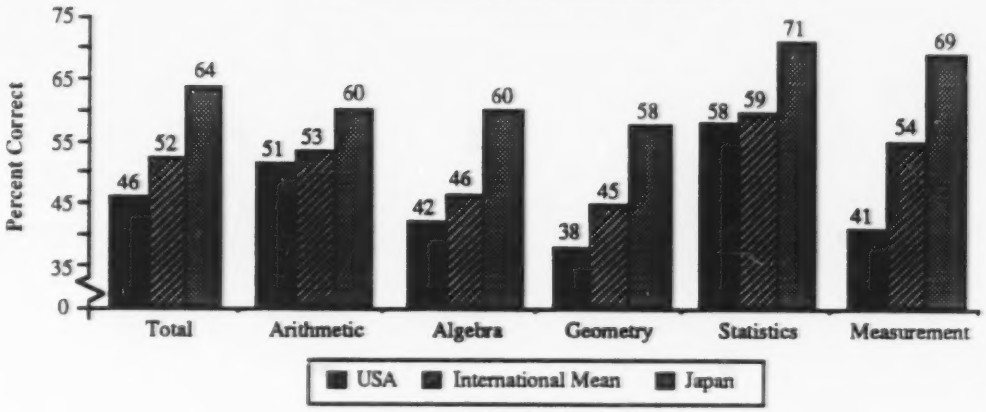
- The bottom twenty-five percent of students in the United States score especially low on these tests.

One way of assessing the quality of the U.S. workforce of the future is by comparing the achievement of students in the United States in math and science to students in other countries. In 1981-1982, the Second International Mathematics Study was conducted in twenty-four countries and provinces by the International Association for the Evaluation of Educational Achievement (IEA); in 1983-1986, the IEA conducted the Second International Study of Science in seventeen countries. Both studies sampled students who were enrolled in the grade in which most fourteen-year-olds were enrolled. In the U.S., this was the eighth grade. This is the grade level which, in most countries, is near the end of full time compulsory education and where almost all students of that age are enrolled in school (about ninety-eight to ninety-nine percent in all countries). These assessments indicate that, on average, the preparation of U.S. students in math and science was inferior to most of the other countries participating in these studies.

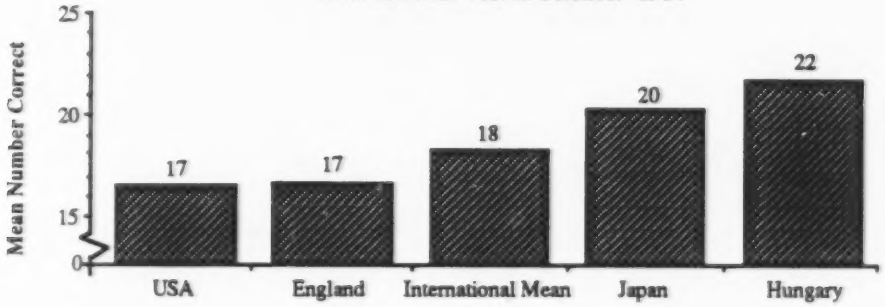
The International Math Study tested students' achievement in five mathematics subareas: arithmetic, algebra, geometry, statistics, and measurement. In all areas, U.S. students performed below the international average and on total score U.S. eighth graders ranked fifteenth out of the twenty countries participating. The International Study of Science assessed students' science achievement on a wide range of content areas determined by the IEA to be a part of a common international science curriculum. U.S. students again scored below the international mean on this assessment and ranked seventeenth out of twenty countries, better than only the Philippines, Hong Kong, and Singapore.

An increasing concern among educators and employers in the U.S. is not only the relatively low level of math and science achievement of the average U.S. student, but the especially low level of achievement of those "at-risk," those groups which we have seen will be making up a growing share of the U.S. workforce in the year 2000. We, as Americans, have always prided ourselves on the egalitarian nature of our school system in comparison to the reportedly more elitist school systems in other countries. It has also been suggested that the lower overall achievement of U.S. students is due to the U.S. system's attempt to provide equal educational opportunity to all of our young people. Other nations, it is alleged, emphasize the education of a high achieving elite group of students over the education of all students. How then do the lower achieving students in the U.S. compare with lower achieving students elsewhere? When we compare the relative standing of the bottom twenty-five percent of students in the U.S. to the bottom twenty-five percent of students in other countries participating in the International Study of Science, U.S. students' relative standing is even worse, ranking last among all participating countries.

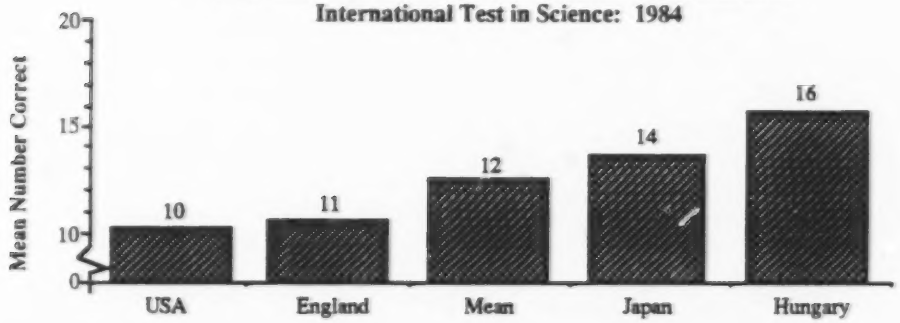
Performance of 8th Grade Students on an International Test in Mathematics: 1982



Performance of 8th Grade Students on an International Test in Science: 1984



Performance of Bottom 25% of 8th Grade Students on an International Test in Science: 1984



SOURCE: IEA (1988).

Indicator 18: Young Americans' Geographic Literacy

- Young Americans' knowledge about the location of important places in the world is poorer now than it was forty years ago.

Measuring the various kinds of "literacy" among American youth has become a popular pastime for professional groups over the last few years. Along with the usual NAEP assessments, numerous other "report cards" have been released, assessing American youth's knowledge in areas such as economics, science, "culture," and history. Consistently, these reports show that young American adults do not possess basic information about the world around them—facts that most people presume virtually everyone would know. Paralleling these reports, data from a survey released by the National Geographic Society (1988) shows that young people are also hopelessly ignorant of basic geography. Furthermore, they are more ignorant now than they were forty years ago. The graph at the top of the next page shows that among the findings of this survey, American young people ages eighteen to twenty-four could, on average, correctly identify less than three out of twelve European countries on a blank outline map.[15] In 1947, eighteen- to twenty-four-year-olds could correctly identify about five out of the twelve countries. Young people might have been more aware of European geography in 1947 because of recent events in World War II. However, the graph at the bottom of the next page shows that young adults are also less aware now of the geography of their own country than they were forty years ago, correctly identifying less than half of the U.S. states on a blank outline map.[16]

Another yardstick by which to measure American youth's knowledge of geography is against similar age youth in other countries. Young people in nine countries were given a blank map of the world and asked to identify sixteen places (thirteen countries, one general area, and two bodies of water).[17] American youth could only identify about seven out of the twelve places, last among all the countries in the survey. Other findings across the country also demonstrate American youth's basic lack of understanding about the world around them: at California State University at Fullerton, half of all students cannot find Japan on the map; at the University of North Carolina, less than half of the students know the names of the two largest states in the union, and only twenty-one percent of them can name the two smallest. "Geographic literacy" is critical for further learning in social studies and business and for full participation in a nation that inhabits a shrinking "global village." Unfortunately, at this time of more interdependent global economy, our youth are becoming more isolationist in their knowledge about the world. In releasing this study, Gilbert H. Grosvenor, National Geographic Magazine's editor, characterized the American young people as truly the "lost generation"—they really have no idea where they are.

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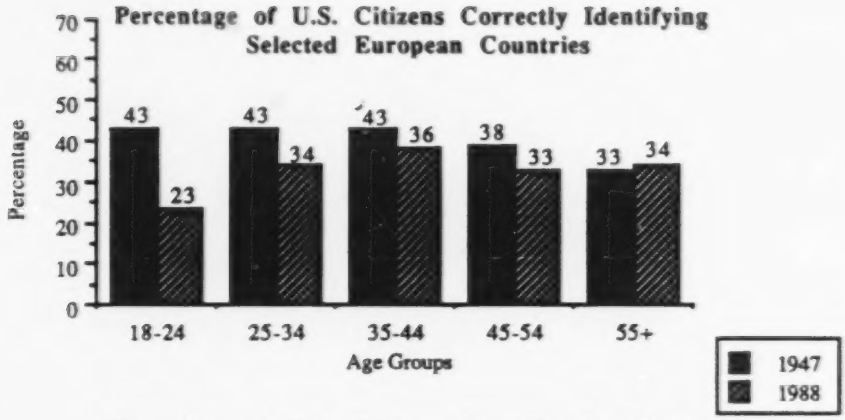
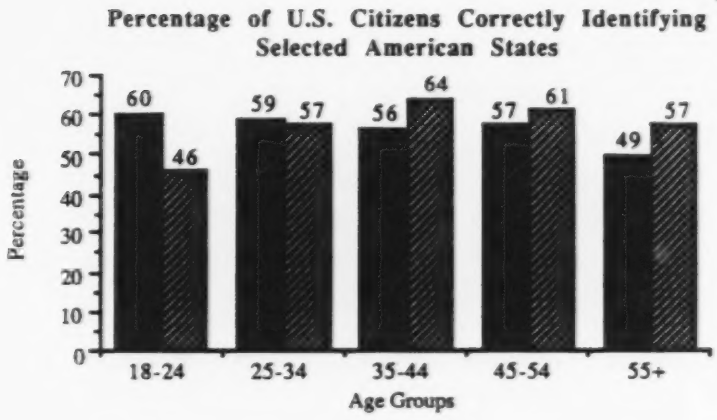
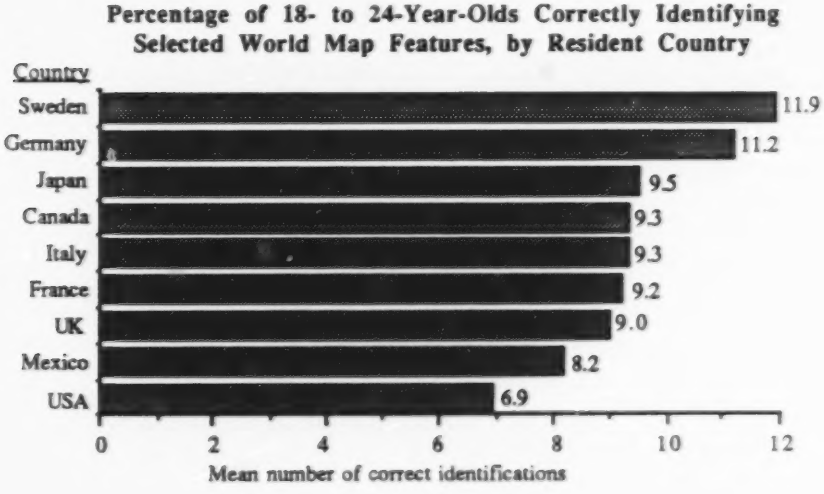
[15]The countries were England, Italy, France, Spain, Poland, Holland, Greece, Czechoslovakia, Yugoslavia, Hungary, Rumania, and Bulgaria.

[16]The states were Texas, California, Pennsylvania, New York, Illinois, Ohio, Michigan, New Jersey, Missouri, and Massachusetts.

[17]The sixteen places to be identified were the U.S., the USSR., Central America, Japan, Canada, France, the Persian Gulf, Mexico, Italy, Sweden, the United Kingdom, South Africa, West Germany, the Pacific Ocean, Egypt, and Vietnam.







SOURCE: U.S. Department of Commerce, Bureau of the Census (1987).

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